Module Description

Module name	Cyber Physical System
Module level, if applicable	Bachelor of Informatics
Code, if applicable	21D12141003
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	7th
Person responsible for the module	Dr. Adnan, ST.,MT.
Lecturer	Dr. Adnan, ST.,MT.
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is an elective course and offered in the 7th semester.
Type of teaching, contact hours	Teaching methods: [group discussion], [collaborative learning], [project-based learning]. Teaching forms: [lecture], [tutorial] CH : 08.00 - 16.00
Workload	For this course, students are required to meet a minimum of 136.00 hours in one semester, which consist of: - 40.00 hours for lecture, - 48.00 hours for structured assignments, - 48.00 hours for private study
Credit points	3 credit points (equivalent with 5.1 ECTS)
Requirements	Students have participated in at least 80% of the learning activities

according to the examination regulations	(Academic Regulations, Chapter VII)
Recommended prerequisites	Computer Networks
Module objectives/intended learning outcomes	After completing the course, Students are able: **Intended Learning Outcomes (ILO):** **ILO 1 :** Have the knowledge of fundamental in Computing Science that includes basic theory and concepts of computer science, Mathematics and Statistics, Programming Algorithm, Software Engineering, Information Management and Digital Resilience, also the advance topics of either Artificial Intelligence, Data Science, Computer Network, Cloud Computing or Internet of Things. **ILO 4 :** Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements by applying computer science theory and software development fundamentals. **ILO 6 :** Perform effectively in a team, either as a member or leader, in activities related to the program's discipline **Course Learning Objective (CLO):** After taking this course, students can describe the principles of design and validation of Cyber-Physical System; students can design and evaluate CPS requirements based on operating system and hardware architecture constrain; students can work in a group to create a simple Cyber-Physical System application as their final project **Sub CLO :** ILO 1 = > CLO 1: Students should be able to describe the principles of design and validation of Cyber-Physical Systems. ILO 4 => CLO 2: Students should be able to design and evaluate CPS requirements based on operating system and hardware architecture constraints. ILO 6 => CLO 3: Students can work in a group to create a Cyber-Physical System application as their final project

Content	Students will learn about : 1. Cyber-Physical System History and Definitions 2. Internet of Things History and Definitions 3. Comparison of CPS and IoT 4. Characteristic of Cyber-Physical System (CPS) 5. Modeling Dynamic Behaviours 6. Design of Embedded Systems 7. Analysis and Verification of CPS 8. CPS applications and case studies
Forms of Assessment	Assessment techniques: [observation], [participation], [written test]. Assessment forms: [quiz], [assignment], [presentation]. CLO 1 - ILO 1 --> 25% (Quizzes: written test) CLO 2 - ILO 4 --> 15% (Quizzes: written test) and 25% (Assignment: participation) CLO 3 - ILO 6 --> 35% (Presentation: observation)
Study and examination requirements and forms of examination	**Study and examination requirements:** - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. - Students must attend the exam to get a final grade. **Form of examination:** Written test
Media employed	Video conference, slide presentation, Learning Management System (LMS)
Reading list	**Main :** Edward Ashord Lee, Sanjit Arunkumar Seshia. Introduction to Embedded Systems (A Cyber-Physical System Approach). 2017